Theme V (Agenda Item 7.0) Groundfish Assessment accomplishments relative to mandates

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Theme V: Accomplishments relative to mandates:

Does the Center achieve adequate assessment accomplishments relative to mandates, particularly with respect to the number of Fishery Management Plan species assessed?

a) How many FMP and non-FMP stocks are being assessed?

b) Do current and planned fishery stock assessments meet regional, national and international expectations in terms of quality, quantity and timeliness?

c) How well does the Center attain a prioritized portfolio of baseline assessments for all managed stocks (including data-poor) and full assessments for important stocks?

d) How well does the Center consider ecosystem and environmental factors affecting fish stocks and their assessments?

a) How many FMP and non-FMP stocks are being assessed? *and*
c) How well does the Center attain a prioritized portfolio of baseline assessments for all managed stocks (including data poor) and full assessments for important stocks?

- Groundfish FMP has 90+ species, many with multiple area (modest number are ecosystem component)

- Despite drop in State/ partner involvement, number of benchmark assessments has increased over past decade (except for 2005 high water mark)

- Currently ~8-10 full benchmark assessments, 1-3 updates and 4-7 data moderate (plus 50 or more data poor) assessments per biennial cycle

- Number of stocks assessed has increased sharply with application of data-poor and data moderate approaches (all targeted stocks have a rationale for an ACL)
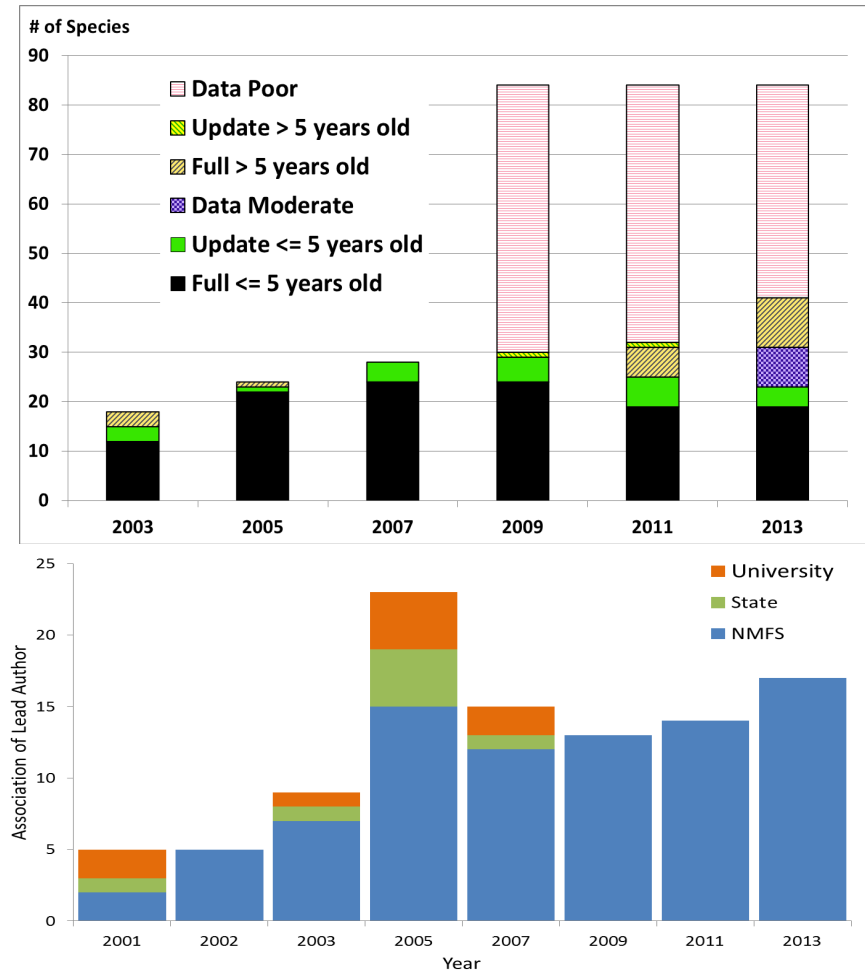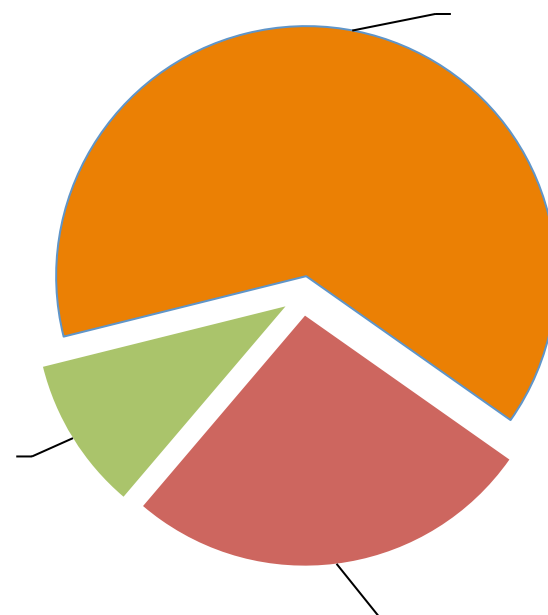
Groundfish Assessment Units by Category
(prepared by NWFSC, excludes Pacific hake)

% in each Category

% of ACL by Category
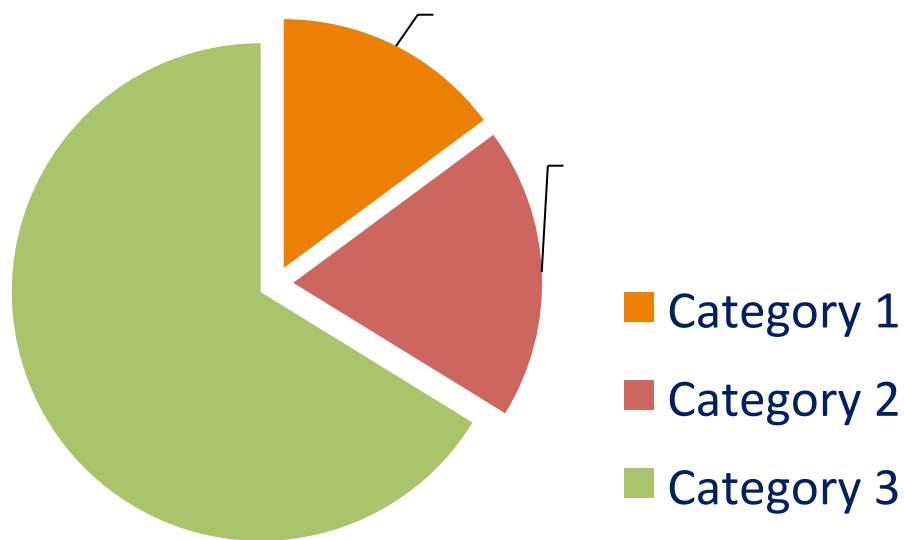
- Category 1
- Category 2
- Category 3

N = 148

Total = 167,348 mt

# Groundfish: Ending overfishing and rebuilding stocks

Effort has been disproportionately focused on rebuilding species. Ten stocks have been declared overfished, three have since rebuilt, three more expected to rebuild in next assessment cycle

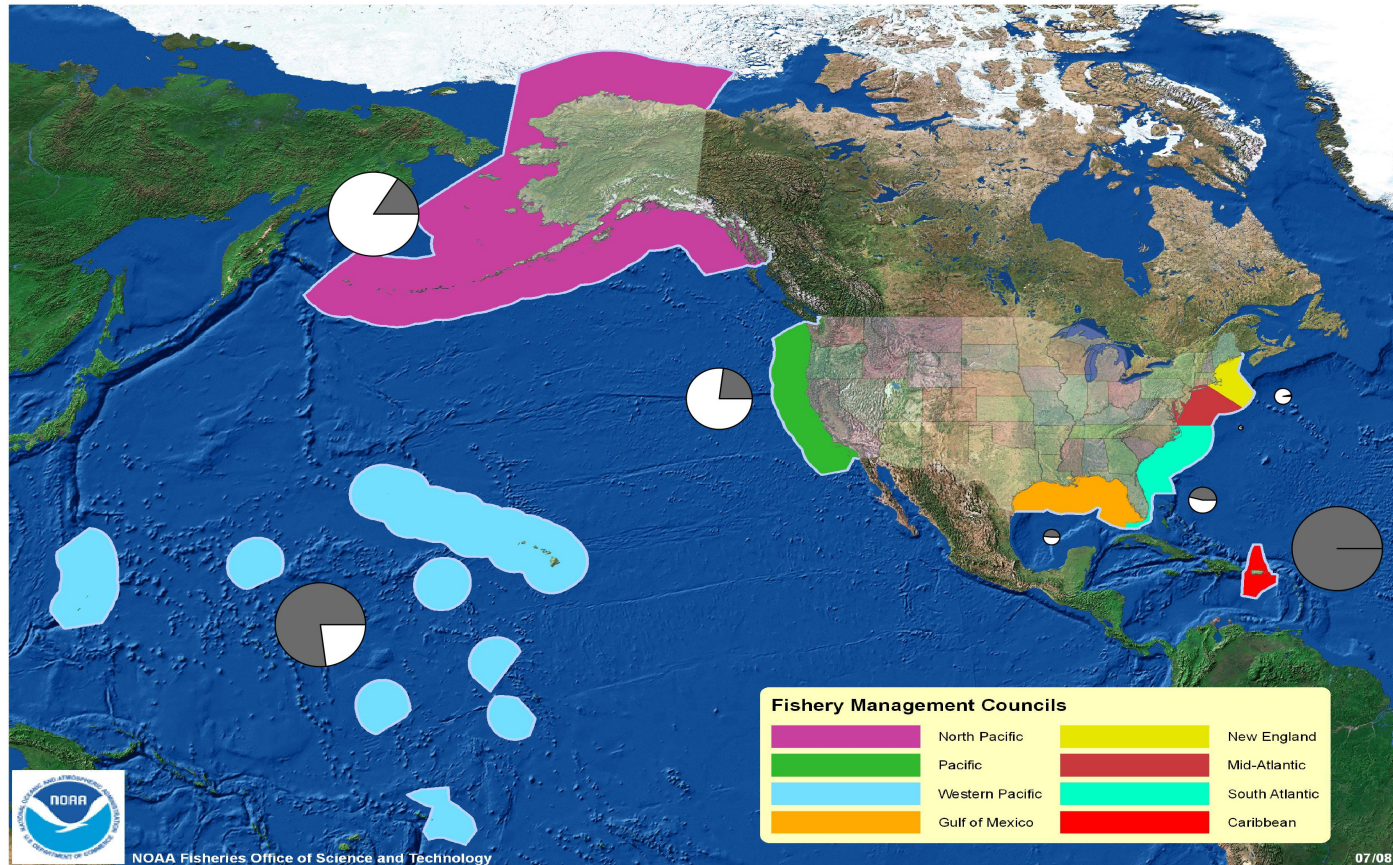| Overfished Stock	Year Declared	Year Rebuilt	Median Time to Rebuild
Bocaccio Rockfish	1999		2021
Pacific Ocean Perch	1999		2051
Lingcod	1999	2005	
Canary Rockfish	2000		2030
Cowcod Rockfish	2000		2019*
Darkblotched Rockfish	2000		2017
Widow Rockfish	2001	2011	
Yelloweye Rockfish	2002		2067
Pacific Hake	2002	2004	
Petrale Sole	2010		2013
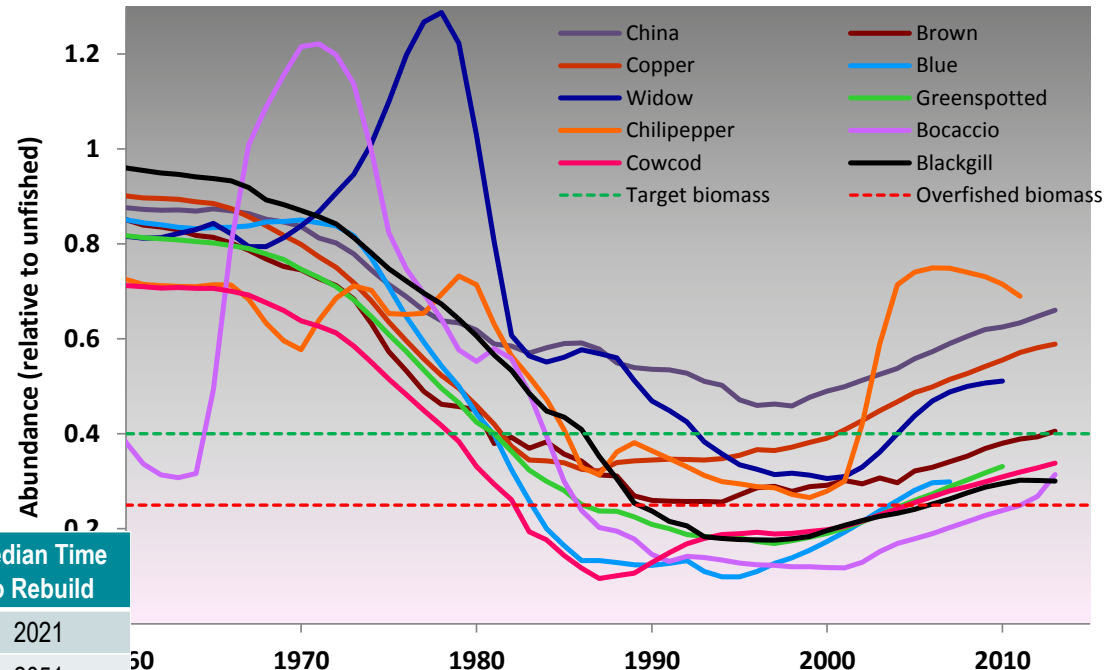
Declines generally considered to be a combined result of overexploitation and poor recruitment/ocean conditions in 1990s. Many other stocks were below target (or limit) thresholds during that period (stocks in figure assessed by SWFSC).

As rebuilding continues, most non-rebuilding stocks are currently above (to well above) target levels, and total mortality is typically << OFL
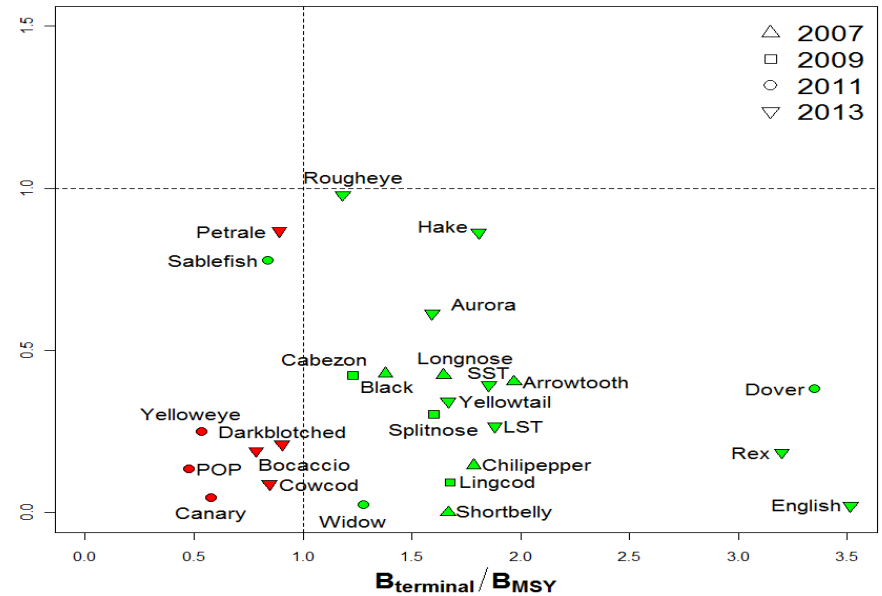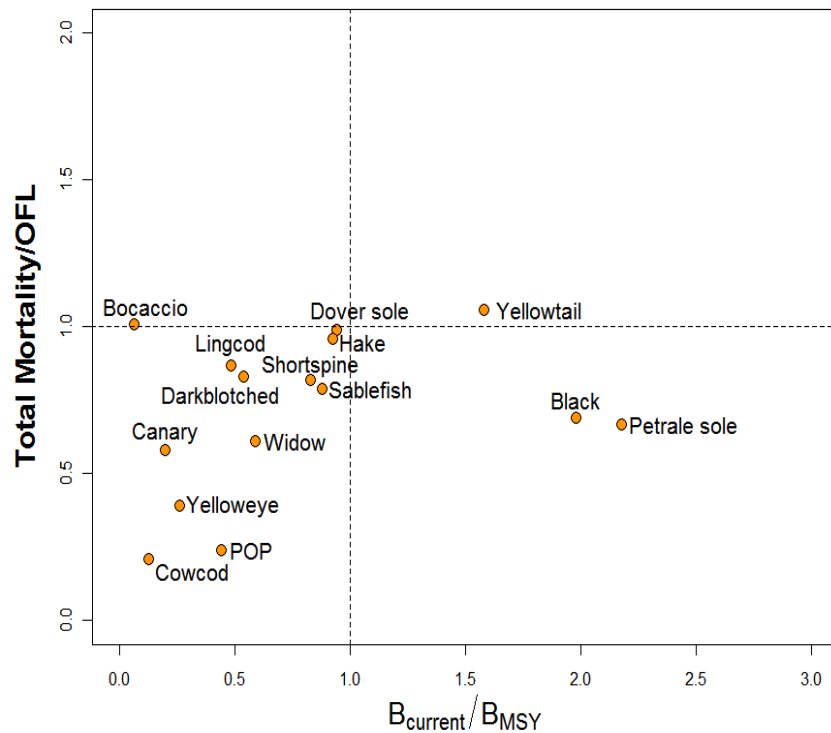
b) Do current and planned fishery stock assessments meet regional, national and international expectations in terms of quality, quantity and timeliness?

Fishery Management Councils

North Pacific (magenta)		New England (yellow)
Pacific (green)		Mid-Atlantic (red)
Western Pacific (light blue)		South Atlantic (teal)
Gulf of Mexico (orange)		Caribbean (red)

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Overall, PFMC and NWFSC/SWFSC do well in that >75% of ACLs use more than a "catch only" approach (much greater by volume). Here, the size of pie chart scales to number stocks per FMC, grey denotes fraction for which ACL's based on catch-only methods (Berkson and Thorson 2014)

PFMC has adopted a robust approach towards accounting for uncertainty to prevent overfishing
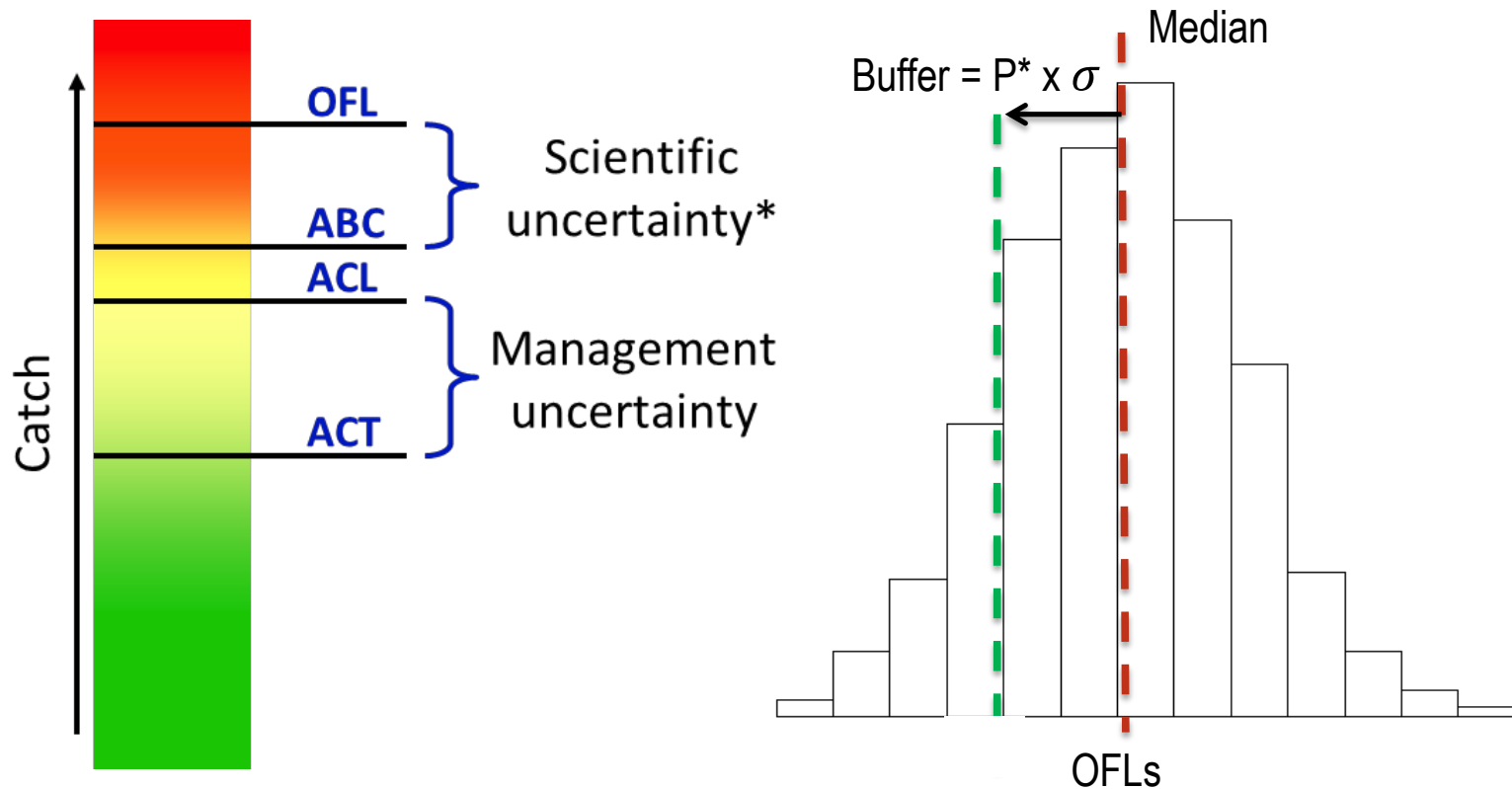
Meta-analysis to determine sigma for category 1 stocks (Ralston et al. 2011, Best Paper Fish Bull.)

Increase in Groundfish FSSI scores is highly consistent with (slightly improved on) national trend

% of Possible FSSI Score

Legend:
- National Total (red)
- PFMC Groundfish (blue)

Data labels:
- 38.9% (National Total, 2000)
- 38.1% (PFMC Groundfish, 2000)
- 40.1% (PFMC Groundfish, 2004)
- 53.2% (PFMC Groundfish, 2005)
- 64.1% (PFMC Groundfish, 2008)
- 72.8% (PFMC Groundfish, 2013)
- 68.6% (National Total, 2013)

X-axis: 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013

Status	Points Awarded
"Overfished" status is known	0.50
"Overfishing" status is known	0.50
Overfishing is not occurring (for stocks with know "overfishing" status)	1.0
Stock biomass is above the "overfished" level defined for the stock	1.0
Stock biomass is at or above 80% of the biomass that produces MSY 1.0	1.0

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d) How well does the Center consider ecosystem factors affecting fish stocks and their assessments?

- In general, tremendous amount of research into ecosystem factors and interactions, but modest success formally incorporating ecosystem impacts into assessments. Terms of reference do call for a section on "Ecosystem considerations" in assessment documents

- Rockfish recruitment survey produces year-class strength indices that are used in many assessments, survey links recruitment process studies to assessments (also supports other ecosystem research)

- Chilipepper rockfish assessment includes time-varying growth in which periods are "blocked" by PDO regimes (but relationship may be weakening)

- Ongoing research into environmental effects on fecundity and reproductive success, particularly with respect to southern rockfish with multiple broods (bocaccio, chilipepper, cowcod) – indications are that reproductive output of many species is very sensitive to env.

- Research into climate drivers of Humboldt squid range expansion, consequences to hake abundance and productivity (predation)

Strengths, Challenges, Strategies

Strengths

- Robust assessments using reliable tools and undergoing rigorous review process

- Emergent suite of data-poor and data-moderate methods allow us to better match methods to data availability and level of need

- All targeted groundfish stocks have a basis for ACL (little involvement in stocks outside FMP)

Challenges

- Workload is almost always greater than resources, many additional data, analytical support needs, to do the job right (particularly species in nearshore, untrawlable habitat).

- Due to biennial cycle and management measures review, assessments begin to become stale before results are implemented (2012 data informs 2015-2016 management)

- Ecosystem effects are known to be very important to many stocks, but difficult to quantify and incorporate into assessments

Strategies

- Better utilization of updates to increase timeliness and throughput, consider other means to improve timeliness of data availability and assessment implementation

- Continue to recruit additional staff with expertise in data analysis, modeling, MSE

- Continue to pursue research into ecosystem effects, vital for improving our long-term understanding of drivers of productivity!